

REMARKS

The Examiner has acknowledged the Applicants' election of the species of Figure 4 in Paper No. 9. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse. It is noted that claims 9-11, 32-34 and 48-50 have been cancelled by applicants.

The Examiner has objected to the drawings as failing to comply with 37 C.F.R. 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "notches 158" (see Applicants' specifications page, 16, line 5). A proposed drawing correction or corrected drawings are required in reply to the Office Action to avoid abandonment of the application.

The Examiner has objected to the disclosure because of the following informalities: on page 16, lines 2 and 3, "circuit board 32, 26" and "housing 50" should be – circuit board 32, 36–, and housing 30– respectively. Appropriate correction is required.

The Examiner has objected to claims 1-4, 23-24, 26, 28, 30, 42-43, 45-46, 58, 60, and 61 because of the following informalities:

Claim 1, lines 8-9, "the open end housing" should be –the open end of the housing–.

Claims 28, line 3, "the input signal pads", and "the substrate" should be –the input signal pad of the second substrate–, and –the second substrate–, respectively.

Claims 3, 4, and 30, line 5, "the substrate" should be –the first substrate–.

Claims 23 and 42, "the substrate" both in lines 3 and 4), and "substrate" (line 7) should be – the first substrate–.

Claims 24, 43 and 58, both terms "the substrate" (claim 24, lines 3 and 4; claims 43 and 48, line 4) should be – the first substrate–.

Claims 26 and 45, "the input signal pads" (line 3), "the substrate" (lines 3 and 5) and "the signal pads" (line 5) should be –the input signal pads of the second substrate, – the second substrate–, and –the input signal pads–, respectively.

Claim 46, "the substrate" (line 10 (two terms), 13, 17 and 24), "the carrier" (line 111), and "the cover" (line 14) should be –the first substrate–, the substrate carrier–, and the substrate carrier cover –, respectively.

Claims 60 and 61, "the input signal pads" (lines 3 and 5), "the substrate" (lines 4 and 6), "the input signal circuits" (line 4), and "the signal pads (line 7) should be –the input signal pads of the second substrate–, the second substrate–, the input signal circuits of the second substrate–, and – the input signal pads–, respectively.

Appropriate correction is required.

The Examiner has rejected claims 15, 17, 20, 22, 27-31, 35-47 and 51-61 under 35

U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 15, 20, 38, 41, 54 and 57, the limitation "the first bore" (lines 3 and 4) has not been recited previously; therefore this term is indefinite.

In claims 17, 22, 54, and 57, it is not clear "the latching members" referred to which "latching members" (i.e. to "the flanges include latching members" recited in claims 16, 21, 53, 56, respectively, or to "the removable signal contact holder further comprises a planar frame member and latching members" recited in claims 4, 46, respectively.

In claim 27, the limitation "a probe head retention member having bores formed through the housing" is unclear and inaccurate since it appears that the bores of the probe head retention member could not be formed through the housing.

In claim 46, the limitation "a probe head retention member having bores formed through the substrate carrier" is unclear and inaccurate since it appears that the bores of the probe head retention member could not be formed through the substrate carrier.

Claims 28-31, 35-37, 39-40, 42-45, 47, and 51-61 are rejected since they depend on rejected base claims.

In light of the uncertain language found in the claims, no art has been applied for claims 27-31, 35-47 and 51-61. Therefore, the claims are not necessarily allowable over the prior art until applicants clarify the meaning of the claims' limitations.

The Examiner has rejected claims 1-6 and 23-26 under 35 U.S.C. 102(b) as being anticipated by Daly et al. (USP 5,007,858).

As to claim 1, Daly et al. disclose, in Figs. 1-4, a multi-channel, low input capacitance signal probe head (10) comprising: at least a first substrate (16 in Fig. 2 or left 16 in Figs. 3-4) having a plurality of input signal pads (96, 98, Fig. 2) formed thereon with the input signal pads (96, 98) being exposed on one end of the substrate (16); a housing (50), Fig. 2) having at least a first open end (64) and a substrate support member (52) that receives the substrate (16) such that the input signal pads (96, 98) are exposed at the open end (64) of the housing (50); and a removable signal contact holder 120 (Fig. 1) mounted to the housing (50) and supporting electrically conductive elastomer signal contacts (196) 198, Figs. 3-4) with the holder (120) disposed over the open end (64) of the housing (50) such that the elastomer signal contacts (196, 198) engage the input signal pads (96, 98).

As to claim 2, Daly et al. disclose in Fig. 2, a second substrate (18) having a plurality of input signal pads (96, 98) formed thereon with the input signal pads (96, 98) of the second substrate (18) being exposed on one end of the second substrate (18) with the substrate support member (52) receiving the second substrate (18) such that the support

member (52) is disposed between the first and second substrates (16, 18) and the input signal pads (96, 98) on the second substrate (18) are exposed at the open end (64) of the housing (50).

As to claim 3, Daly et al. disclose in Fig. 2, the housing (50) further comprises opposing sidewalls (i.e., horizontal walls) separated by opposing front and back walls (i.e., walls perpendicular to horizontal walls) with each sidewall having a latching recess (see Fig. 2) formed therein adjacent to the open end (64) of the housing (50), and bores (60) formed through the housing (50) on either side of the first substrate (16) that are perpendicular to the open end (64) of the housing (50).

As to claim 4, Daly et al. disclose in Figs. 3-4, the removable signal contact holder (120) further comprises a planar frame member (154) and latching members (164) extending perpendicular from either end of the frame member (154) with at least a first slot (i.e., cavity for inserting the elastomer signal contact 196, 198) formed in the frame member (154) aligned with the input signal pads (96, 98) on the first substrate (right 16) for receiving the electrically conductive elastomer signal contacts (196, 198).

As to claim 5, Daly et al. disclose in Figs. 3-4, the latching members (164) further comprise inwardly facing latching ramps (see Figs. 3-4) with each latching ramp having a terminating ledge that engage the latching recesses in the housing sidewalls.

As to claim 6, Daly et al. disclose in Figs. 3-4, at least a first alignment rib (part of latching members 164) formed parallel to the slot on the planar frame (154) that engages a corresponding recess formed in the housing (50).

As to claim 23, Daly et al. disclose in Fig. 2, the housing 950) further comprises a substrate carrier (also called (53) forming the substrate support member (52) that the receives the first substrate 916) with the input signal pads (96, 98) on the first substrate (16) being exposed at one end of the carrier (52); and a substrate carrier cover (54) having exterior walls forming an interior chamber (see Fig. 2) that receives the substrate carrier (52) and the first substrate (16) with the exterior walls forming the opposing sidewalls and the front and back sidewalls of the housing (50).

As to claim 24, Daly et al. disclose in Fig. 2, the substrate carrier (52) further comprises opposing stiles and rails (see Fig.2) with the stiles and at least one rail having recesses formed on one surface thereof for receiving the first substrate (16) with the end of the first substrate (16) having the signal pads (96, 98) extending to the end of the rail having the recess.

As to claim 25, Daly et al. disclose in Fig. 2, the stiles include the housing bores (60).

As to claim 26, Daly et al. disclose in Fig. 2, a second substrate (18) having a

plurality of input signal pads (96, 98) thereon with the input signal pads (96, 98) of the second substrate (18) being exposed on one end of the second substrate (18) with the stiles and the one rail having recesses formed on the reverse side thereof for receiving the second substrate (18) with the end of the second substrate (18) having the input signal pads (96, 98) extending to the end of the rail having the recess.

The Examiner has objected to claims 7-8, 12-22 as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and overcome the objections/rejections under 35 U.S.C. 112, second paragraph, set forth in this Office Action.

Claims 7-8, and 12-22 recite, inter alia, wherein the frame member further comprises apertures formed on either side of the slot and aligned with the fores in the housing.

The art of record does not disclose the above limitations, nor would it be obvious to modify the art of record so as to include the above limitations.

The prior art made of record by the Examiner and not relied upon is considered pertinent to Applicants' disclosure:

| | | |
|---------------|------------|---|
| Reed et al. | 6,447, 339 | Adapter for a Multi-Channel Signal Probe |
| Kuo et al. | 6.343,957 | Electrical Adapter |
| Reed et al. | 5,915,987 | Latched Electrical Connector |
| Massey et al. | 5,119,020 | Electrical Cable Assembly for a Signal Measuring Instrument and Method. |

By this amendment, Applicants have amended the specification to overcome informalities, submitted an annotated corrected Figure 4 and corrected formal drawing figures 1-8, cancelled claims 9-11, 32-34 and 48-50, and amended claims 1-4, 7, 12, 16, 17, 21-24, 26-28, 30, 32, 37, 38, 40-43, 45, 46, 53, 54, 56-58, 60 and 61.

Applicants have amended claims 1-4, 23, 24, 26, 28, 30, 42, 43, 45, 46, 58, 60 and 61 to overcome the Examiner's objections to the claims and to correct typographical errors in the claims.

Applicants amended claims 3, 37 and 46 to recite "a first bore" to provide an antecedent basis for the term "the first bore" recited in claims 15, 20, 38, 41, 54 and 57 and overcome the Examiner's rejection of claims 15, 20, 38, 41, 54 and 57 under 35 U.S.C. 112, second paragraph. Applicants further amended claims 7 and 12 to recite "the first bore" to reference either "the first bore" or "the second bore" in all occurrences of the word "bore" in the claims.

Applicants have amended claims 16, 17, 21, 22, 37, 38, 40, 41, 53, 54, 56 and 57 to

clarify the distinction between the “latching member extending perpendicular from either end of the frame member”, the latching members extending outward from the retention block alignment flanges” and “the latching members extending outward from the rectangular housing alignment flanges” and overcome the Examiner’s rejection of claims 17, 22, 54 and 57 under 35 U.S.C. 112, second paragraph.

Applicants have further amended claims 27 and 46 to more clearly recite the relationship of the first bores to the housing and overcome the Examiner’s rejections of claims 27 and 46 under 35 U.S.C. 112, second paragraph.

Applicants, respectfully request that the Examiner to reconsider claims 27-31, 35-47 and 51-61 in view of the amendments to the claims.

Applicants claimed invention recites a multi-channel, low input capacitance signal probe head having at least a first substrate having a plurality of input signal pads formed thereon with the input signal pads being exposed on one end of the substrate, a housing having at least a first open end and a substrate support member that receives the substrate such that the input signal pads are exposed at the open end of the housing, and a removable signal contact holder mounted to the housing and supporting electrically conductive elastomer signal contacts with the holder disposed over the open end of the housing such that the elastomer signal contacts engage the input signal pads.

Daly et al. teach an electrical connector 10 for flat power cables 16 and 18 having a receptacle connector assembly 20 and a plug connector assembly 120. The receptacle and plug connectors 20 and 120 are assembled onto an array of terminated, single conductor flat power cables 16 and 18 in pairs of upper and lower cables. Each of the upper and lower power cables have spaced apart tab sections 74 onto which are crimped terminal assemblies 72. The terminal assemblies 72 for the receptacle connector 20 have an array of alternating spring contact arms 92, 94 having acute free ends 96, 98 that are adapted to be deflected upwardly and downwardly upon mating. The terminal assemblies 170 for the plug connector 120 have an array of rigid ramped blade sections that have alternately arranged downwardly and upwardly forward end sections 196, 198 that correspond with the alternating spring contact arms 92, 94. Daly et al. teach that the receptacle and plug terminal assemblies may be formed of beryllium copper, Alloy No. 17410, half HT tempered.

The connector assemblies 20, 120 have respective receptacle and plug metal shells 30, 130 within which are mounted four receptacle and plug housing assemblies 50, 150. The receptacle housing assemblies has a common inner housing member 52 and two hermaphroditic outer members 54. Integrally formed extensions extend from the opposing sides of the common inner housing 52 with each extension having a semicircular aperture

60 formed therein parallel to the mating face 22 of the connector 20. Each outer member 54 has integrally formed extensions extending from their opposing sides with one extension of each outer member having a semicircular leg 56 and the other extension having a semicircular aperture 58. The semicircular legs 56 of the outer members 54 extends through the semicircular apertures 60 of the common inner housing 52 and into the respective semicircular apertures 58 of the other outer members 54. Upon assembly, the covers define a pair of large cavities 64 within which the array of contact arms 92,94 are disposed. Upper and lower receptacle housing assemblies 50 are disposed in passageways formed in the shell 30. The plug housing assemblies 150 are essentially the same construction as the receptacle housing assemblies with the covers defining a pair of forward plug sections 164 having respective cavities in which are disposed the forward end sections 196, 198 of rigid ramp blade sections. Upon mating of the receptacle and plug connector assemblies 20 and 120, the plug section 134 of the shell 130 is closely received in cavity 36 of the receptacle shell 30. The forward plug sections 164 of the plug housing assemblies 150, recessed behind the leading edge of the plug section 134, are received into the respective cavities 64 of the receptacle housing assemblies 50, recessed behind the leading edge of the receptacle hood section 34, with the free ends 96, 98 of the spring contact arms 92, 94 engaging the forward end sections 196, 198 of the rigid ramp blade sections and deflecting upwardly and downwardly. The plug connector 120 includes a threaded jackscrew 300 that is received in a threaded aperture 24 in the receptacle connector 20 to draw the connectors fully together.

In contradistinction to the teachings of Daly et al., Applicants' claimed invention recites a removable signal contact holder mounted to the housing and supporting electrically conductive elastomer signal contacts. Daly et al. teach that the forward plug sections 164 having respective cavities in which are disposed the forward end sections 196, 198 of rigid ramp blade sections. The definition of elastomer in the "IEEE Standard Dictionary of Electrical and Electronics Terms", ANSI/IEEE Std. 100-1984, Third Edition, Published by The Institute of Electrical and Electronics Engineers, Inc. New York, NY states: "Macromolecular material that returns rapidly to approximately the initial dimensions and shape after substantial deformation by a weak stress and release of stress". The United States Patent Office Manual of Classification defines elastomer or plastic in class 277, subclass 944 as "Made of a particular material wherein the composition or substance is rubberlike". Under the class definition for Electrical Connectors in class 439, subclass 86 "including elastomeric and nonmetallic conductive portion", the definition recites: "Electrical connector wherein a component part thereof is intended to transmit electricity, which part is

made of material that is plastic or is other than a metal.” Note (1) states: “A mixture of an elastomeric material and metallic particles is included herein if the mixture retains the general characteristic of an elastomeric material”. Daly et al. teach rigid ramp blade sections which cannot be construed as electrically conductive elastomer signal contacts as recited in Applicants claimed invention since the United States Patent Office Manual of Classification defines elastomer as a composition or substance that is rubberlike. There is no teaching, hint, nor suggestion in Daly et al. of constructing the electrical contacts in either the receptacle or plug connector assemblies from electrically conductive elastomer signal contacts.

In addition, Daly et al. teaches that the free ends 96, 98 of the array of contact arms 92, 94 in the receptacle plug 20 deflect upwardly and downwardly as they engage the forward end sections 196, 198 of the rigid ramp blade sections in the plug assembly 120. Being that the electrically conductive elastomer signal contacts, as recited in Applicants’ claimed invention, are rubberlike, the free ends 96, 98 of the array of contact arms 92, 94 as taught by Daly et al. would not deflect upwardly and downwardly but push into and compress the elastomer signal contacts.

Further, Applicants claimed invention recites that the holder is disposed over the open end of the housing such that the electrically conductive elastomer signal contacts engage the input signal pads. The Examiner interprets Daly et al. as the connector assembly 120 mounted to the receptacle housing assembly 50 and supporting the rigid ramp blade sections having the forward end sections 196, 198 with the connector assembly 120 disposed over the cavities 64 of the receptacle housing assembly 50, such that the rigid ramp blade sections having the forward end sections 196, 198 engage the free ends 96, 98 of the array of contact arms 92,94. However, an examination of drawing figures and specification of Daly et al. show and states that the connector assembly 120 is not mounted to the receptacle housing assembly 50 but to the shell 30 of the receptacle connector 20. Daly et al. states at col. 7, lines 55-59: “The plug connector 120 is aligned form mating with the receptacle connector 20 and metal shell 130 thereof includes a plug section 134 adapted to be receivable in a close fit into receptacle cavity 36 of receptacle shell...”. Further, Daly et al. states at col. 6, lines 6-8: “Plug connector 120 is shown having a jackscrew 300 centrally therethrough having a threaded forward end 306 (Fig. 3) receivable into a corresponding aperture 24 of receptacle connector 20...”. The plug connector 120 can still be mount and secured to the receptacle connector 20 even with the receptacle housing assemblies 50 removed from the receptacle connector 20. Therefore the connector assembly cannot be mounted to the receptacle housing assemblies 50 as asserted by the

Examiner. Additionally, the connector assembly 120 is not disposed over the open end 64 of the receptacle housing assemblies 50 but surrounds and encloses the receptacle housing assemblies 50. The opposite configuration holds true for the plug and receptacle housing assemblies 50, 150. When the plug and receptacle housing assemblies 50, 150 are mated, the receptacle housing assemblies 50 surround and enclose the plug sections 164 of the plug housing assemblies 150. In contradistinction, Applicants' claimed invention recites that the holder is disposed over the open end of the housing and not surrounding and enclosing the open end of the housing.

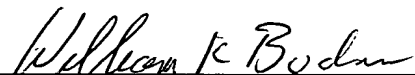
Claim 46 recites at least a first substrate having a plurality of input signal circuits and associated input signal pads formed thereon with the input signal pads being exposed on one end of the first substrate and the input signal circuits being adjacent to and electrically coupled to the input signal pads. Daly et al. does not teach, hint nor suggest a first substrate having a plurality of input signal circuits and associated input signal pads. Daly et al. teaches connectors that are assembled onto an array of flat power cables associated in pairs of upper and lower power cables. There is no reference in the teachings of Daly et al. of input signal circuits associated with the power cables.

Independent claims 1, 27 and 46 are considered allowable as not being anticipated by the teachings of Daly et al. The remaining uncanceled claims depending from the allowable independent claims 1, 27 and 46 are therefore also considered allowable.

In view of the amendments to the specification, drawing figures and claims and the accompanying remarks, Applicants' respectfully request that the Examiner withdraw the objections to the specification, drawing and claims and the rejection of the claims and allow claims 1-8, 12-31, 35- 47 and 51-61 and pass this case to issue.

In accordance with current Patent Office practice, the Examiner is expressly authorized to call the undersigned agent at the number listed below if it is deemed the application is in other than condition for allowance or if prosecution can be expedited.

Respectfully submitted,

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January 22, 2004

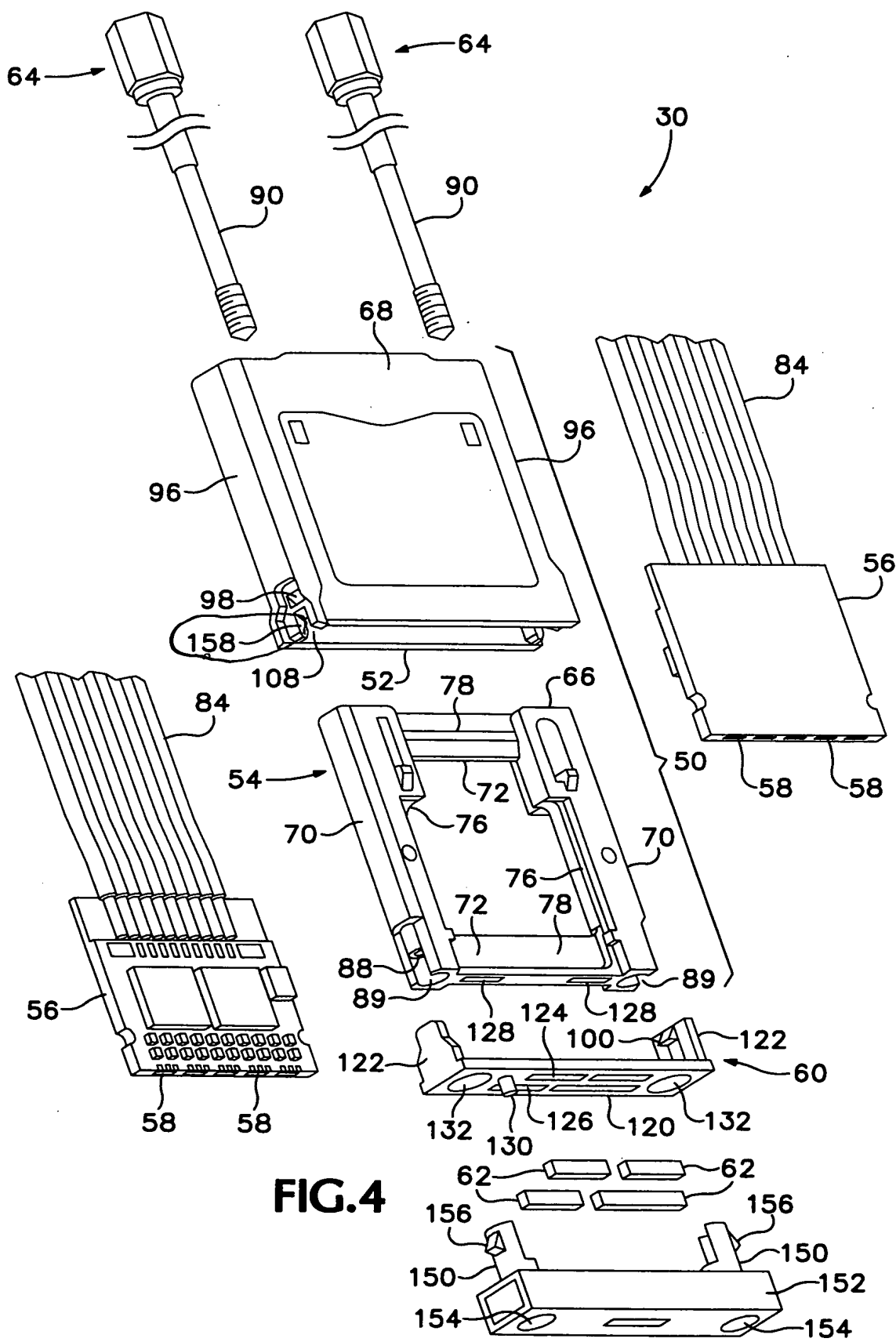
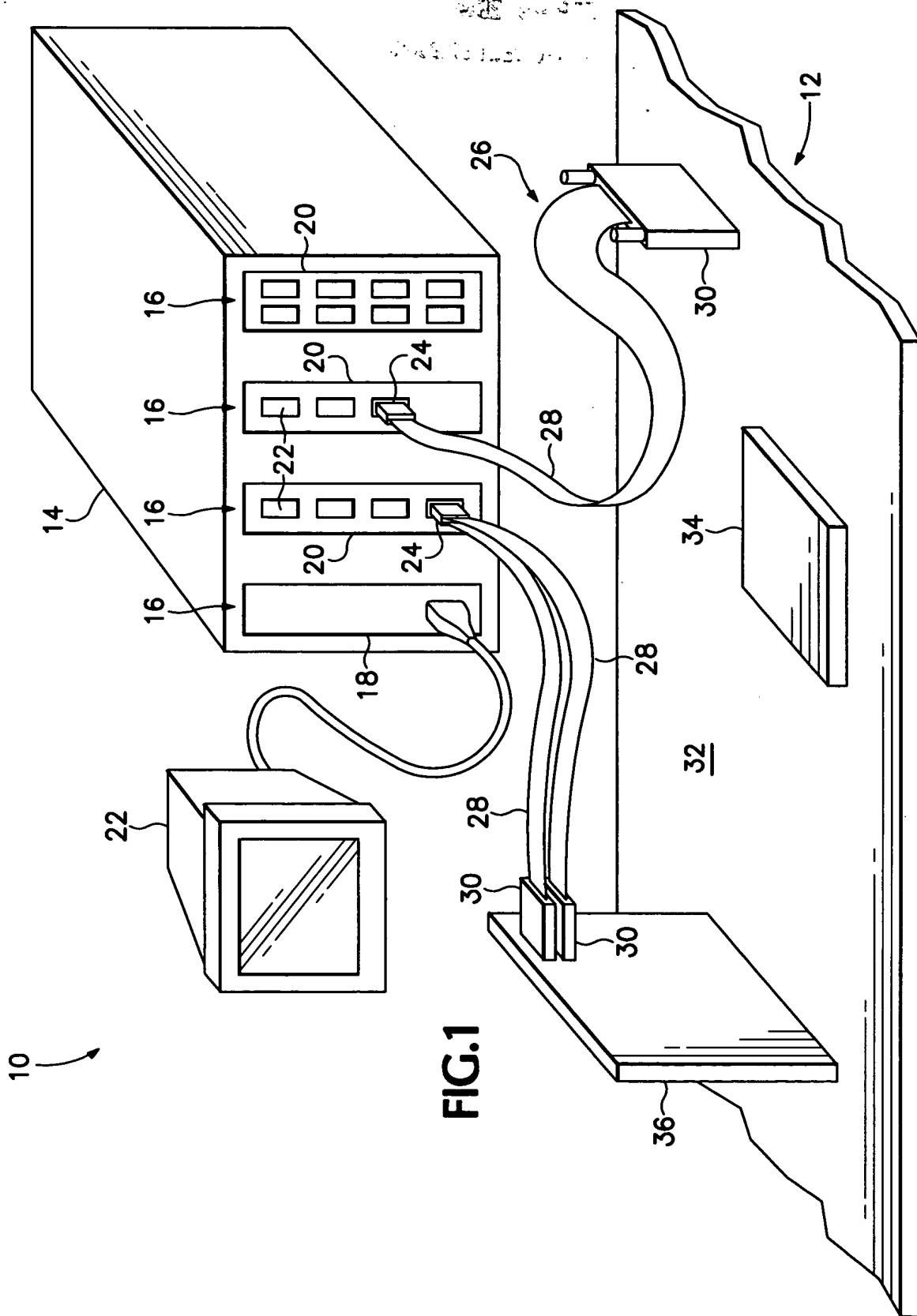


FIG.4





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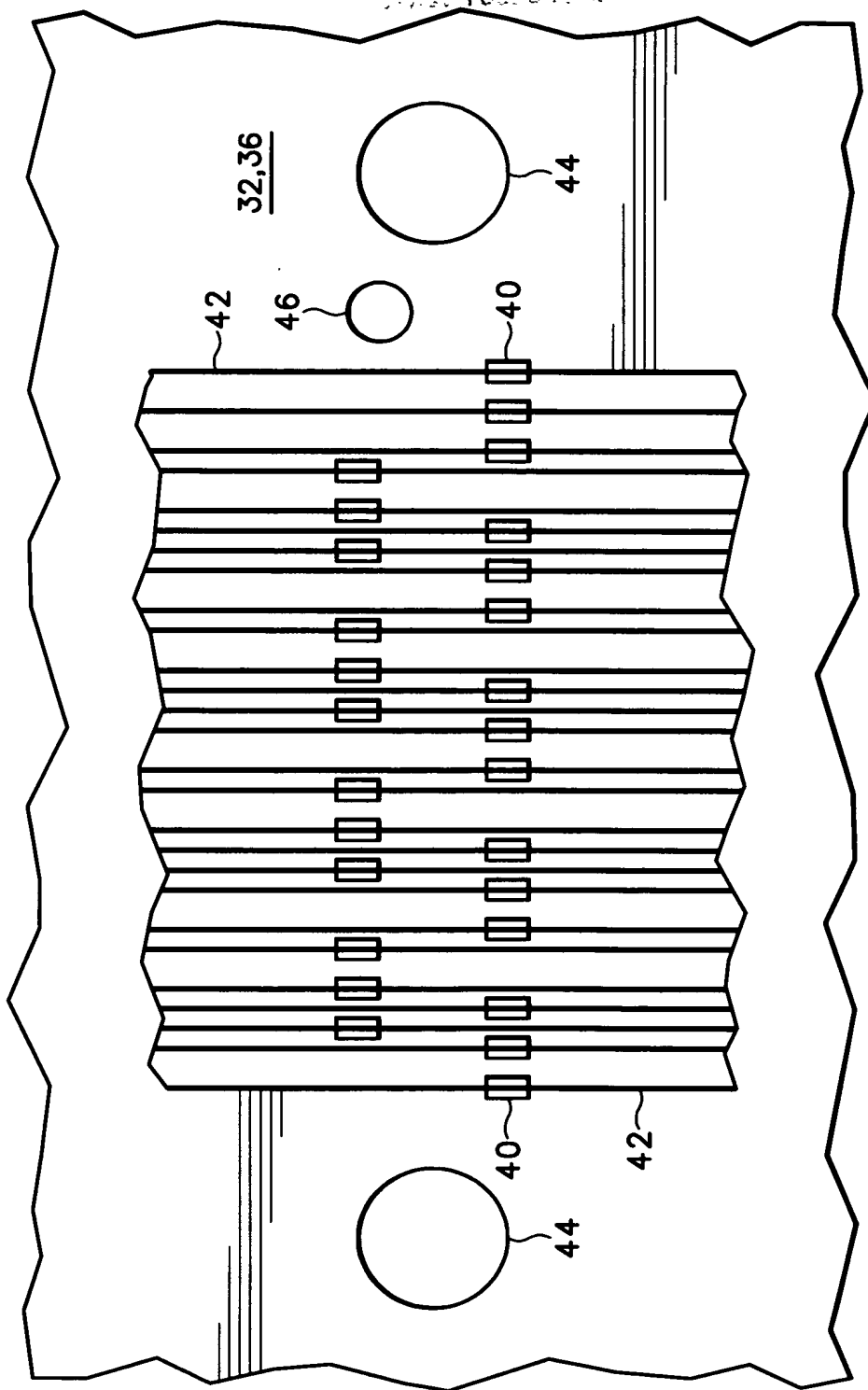
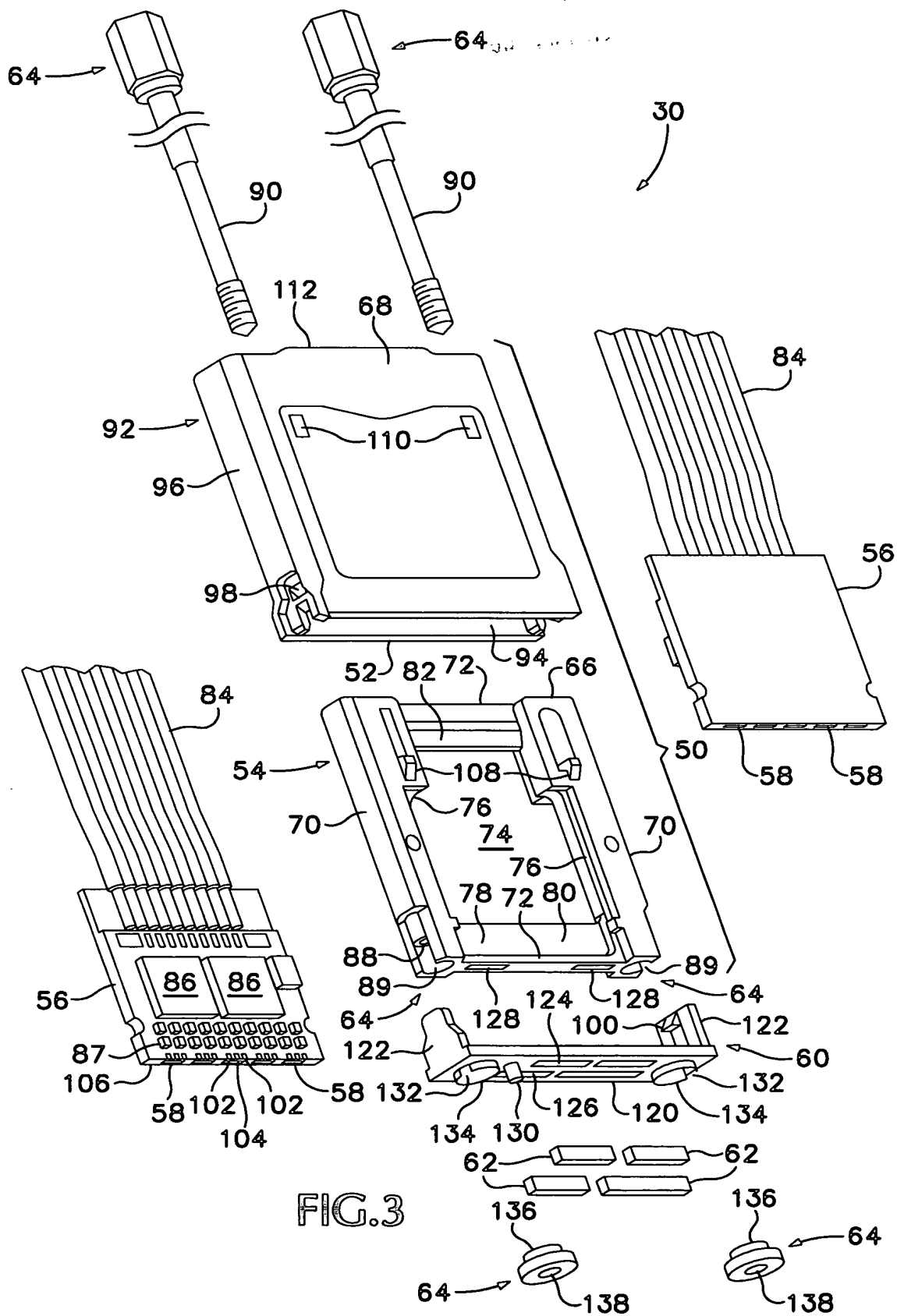
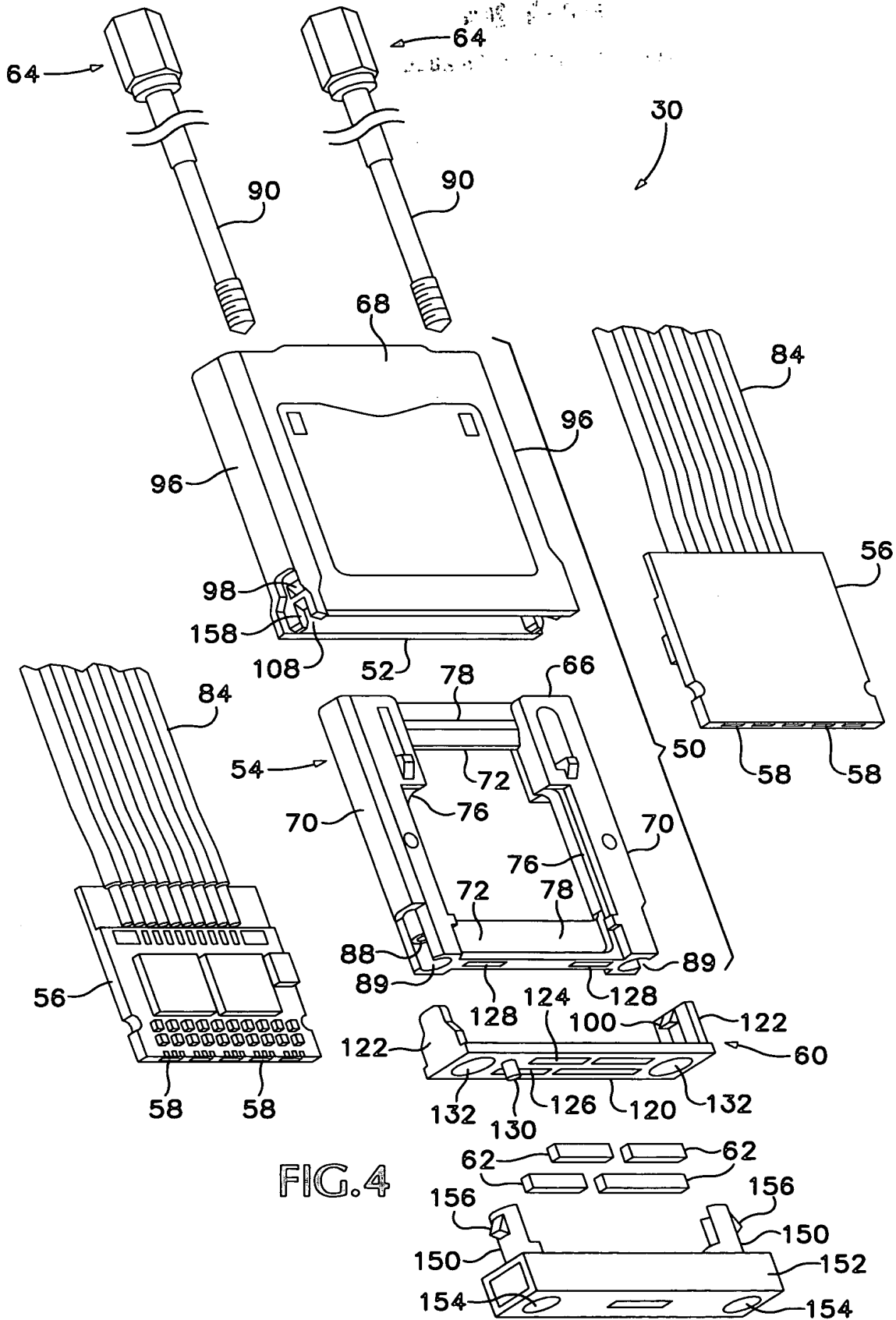


FIG.2





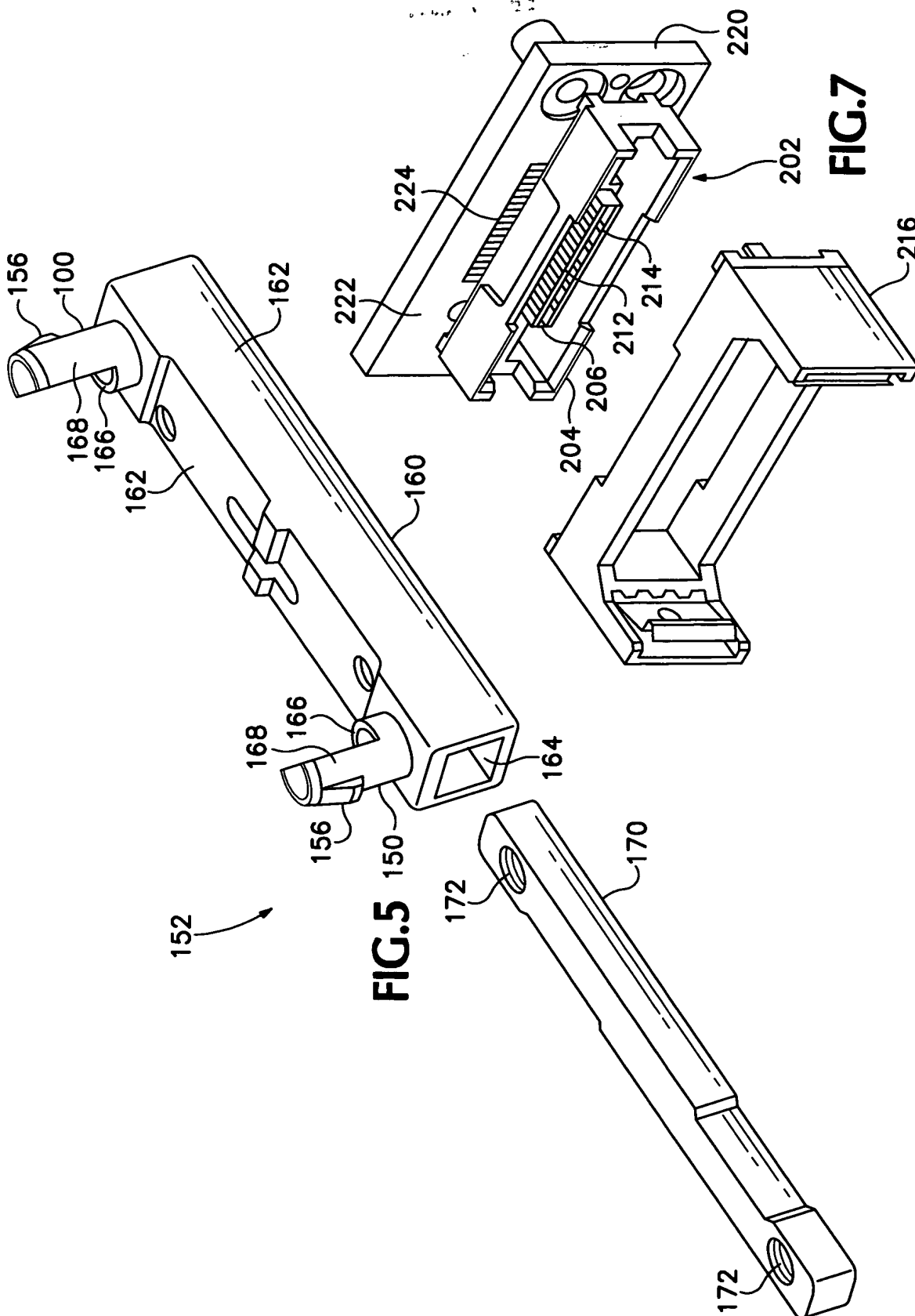
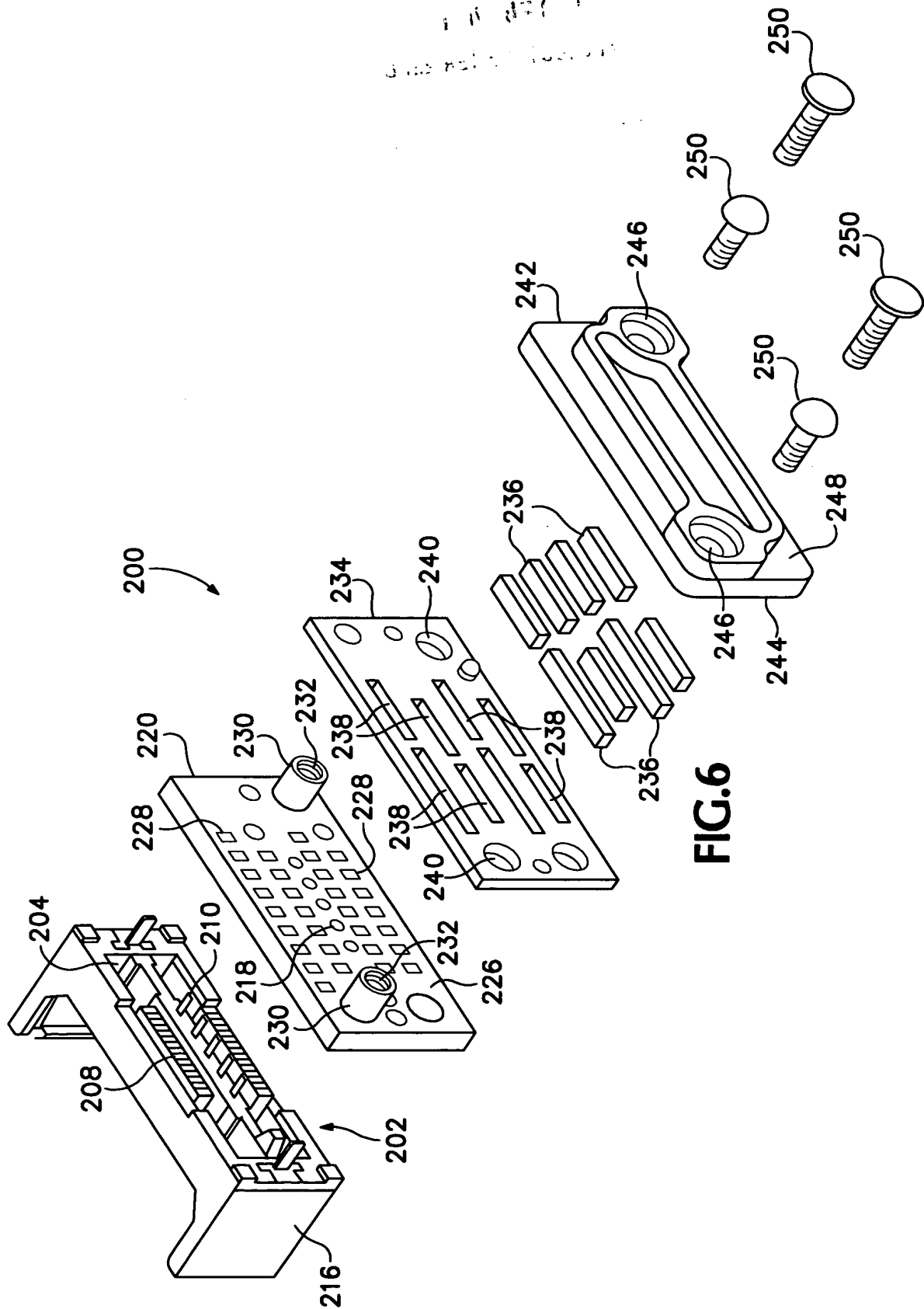


FIG. 5

FIG. 7



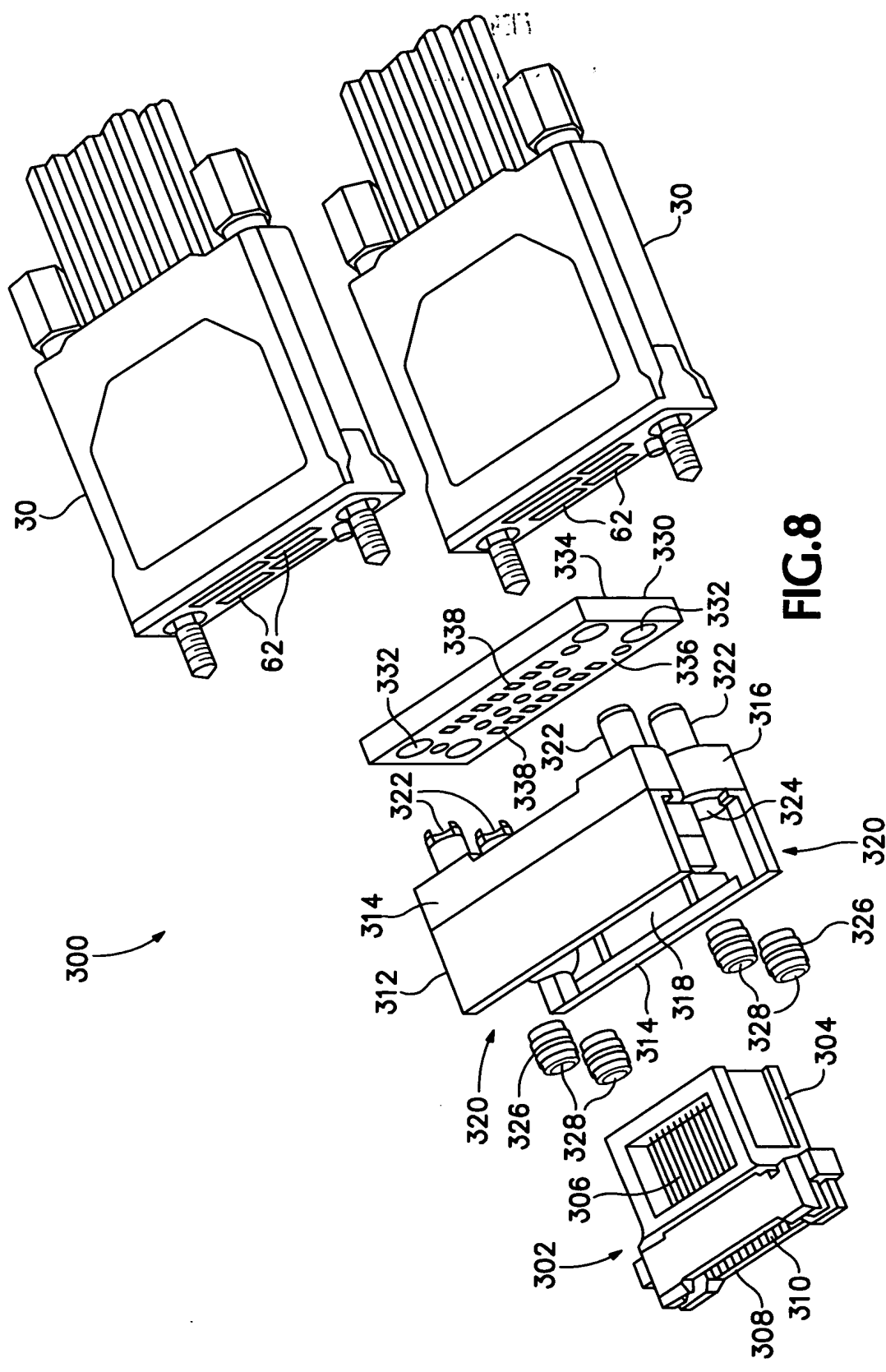


FIG. 8